AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-48 (Cancelled)

49. (New) A method for composition control of copper indium gallium diselenide (CIGS) solar cells fabricated by a co-evaporation deposition process in a process chamber, the deposition conditions being such that a deposited Cu-excessive overall composition is transformed into to a Cu-deficient overall composition by
    a. performing said co-evaporation process in the process chamber of an in-line, continuous substrate flow production system,
    b. detecting where the transition from copper rich to copper deficient composition occurs by using a physical parameter related to the same transition, said instant referred to as a reference transition point.
    c. detecting a shift of the transition point using the physical parameter, and
    d. adjusting the evaporant fluxes in order to bring the transition point back to the reference transition point.
50. (New) A method in accordance with claim 49, wherein said detection is performed at at least one location as seen in a direction over the width of a substrate.
51. (New) A method in accordance with claim 50, wherein a substrate provided with a molybdenum back contact layer moves through the CIGS process chamber, and wherein the physical parameter is monitored at two points, one at each

side of the position the CIGS layer has in the process chamber at the reference transition point, in order to detect the position at which the transformation occurs, said position referred to as a reference position.

52. (New) A method in accordance with claim 51, wherein heating elements are arranged at each side of the position at which the transition occurs, and the method comprising holding the power delivered to the substrate constant and measuring a temperature difference at two adjoining heating elements at the reference position.

53. (New) A method in accordance with claim 51, further comprising holding the temperature of the substrate and deposited CIGS film constant by supplying individually controlled power to the heating elements and measuring a difference in the power delivered at two adjoining heating elements at the reference position.

54. (New) A method in accordance with claim 51, wherein a several pairs of sensors distributed over the width of the process chamber, are used for detection at said two points, the method further comprising assigning each sensor pair a respective set of evaporation sources and adjusting the evaporation flows in each evaporation set individually in order to bring the respective transition points back to their reference transition positions.

55. (New) A method in accordance with claim 51, wherein a pair of sensors is used for detection at said two points, method further comprising adjusting the copper flux in each set.

56. (New) A method in accordance with claim 51, wherein the physical parameter is related to the emissivity of the CIGS layer.

57. (New) A method in accordance with claim 51, wherein the physical parameter is heat capacitivity or, as is known per se, resisitivity.

58. (New) A method in accordance with claim 51, wherein the physical parameter relates to intensity of light reflected by or transmitted through the deposited CIGS film.

59. (New) A method in accordance with claim 51, wherein the physical parameter relates to intensity of specular light in relation to intensity of reflected light.

60. (New) A method in accordance with claim 49, further comprising a step of detecting the deposited amount of constituents of the CIGS film.

61. (New) A method in accordance with claim 49, further comprising providing sets of evaporation sources in rows over the width of a substrate and controlling the evaporant fluxes in the respective rows.

62. (New) A method in accordance with claim 61, further comprising a step of detecting the deposited amount of constituents of the CIGS film.

63. (New) An in-line continuous substrate flow production apparatus for fabrication of copper indium gallium diselenide (CIGS) solar cells comprising a CIGS process chamber in which substrates provided with a molybdenum back contact layer continuously move through a deposition zone (DZ) in the CIGS process chamber, the process chamber comprising a plurality of separated heating elements, wherein at least one sensor is arranged in deposition zone and connected to a controller, the sensor being adapted to measure a physical parameter related to a transformation of the deposited CIGS film from a Cu-excessive composition to a Cu-deficient composition, said transformation taking place at a reference transition point in the process

chamber as the substrate moves through the process chamber, the sensor being arranged to detect a shift of the actual transition point on the moving substrate from the reference transition point by measuring the physical parameter at the deposited CIGS film at the reference transition point, the controller being adapted to receive as input the sensor output signal and to deliver as output a corrective signal that adjusts the evaporant fluxes so that the actual transition point is brought back to the reference transition point.

64. (New) An in-line production apparatus in accordance with claim 63, wherein two sensors, together forming a sensor pair, are arranged at each side of the transition point, that each sensor in the pair is connected to a respective input of the controller, said sensor pair being arranged in a row with the evaporation sources.

65. (New) An in-line production apparatus in accordance with claim 63, wherein a device for detecting the deposited amount of constituents of the CIGS film is provided in the CIGS process chamber.

66. (New) An in-line production apparatus in accordance with claim 63, wherein a sensor pair is associated with an individual set of evaporation sources, and the two sensor pairs are arranged at different locations as seen in a direction over the width of the process chamber, that each sensor pair and its associated set of evaporation sources are arranged in a respective row, and that each sensor pair and set of evaporation sources of a row is connected to a respective controller so as to adjust the evaporation flows in each evaporation set.

67. (New) An in-line production apparatus in accordance with claim 66, wherein there are two rows each one comprising a set of evaporation sources, the two rows of evaporation

sources are arranged at each side of and outside the path along which substrates flow through the deposition chamber.

68. (New) An in-line production apparatus in accordance with claim 66, wherein a device for detecting the deposited amount of constituents of the CIGS film is provided in the CIGS process chamber.

69. (New) An in-line production apparatus in accordance with claim 65, wherein the device for detecting the deposited amount of constituents of the CIGS film is an XRF (X-ray fluorescence) device, an EDX (energy dispersion X-ray spectroscopy) device or a profilometer.

70. (New) An in-line production apparatus in accordance with claim 66, wherein the additional sensor pairs and associated evaporation sources are arranged in a row at a location between said two rows.

71. (New) An in-line production apparatus in accordance with claim 70, wherein one or more additional sensors are connected to an input of the respective controllers, the additional sensors being arranged to measure the physical parameter upstream and/or downstream the reference transition point.

72. (New) An in-line production apparatus in accordance with claim 63, wherein the controller is adapted to change the relative amount of Cu versus In+Ga.

73. (New) An in-line production apparatus in accordance with claim 63, wherein an x-ray fluorescence composition measurement device is provided in the CIGS process chamber said x-ray fluorescence composition measurement device adapted to measure the total deposited amounts of each element (CU, Ga, In, Se) and thereby the thickness and composition of the deposited CIGS layer.

74. (New) An in-line production apparatus in accordance with claim 73, wherein the controller is connected to the x-ray fluorescence composition measurement device and is adapted to adjust the total amount of deposited Cu and/or the total amount of deposited Ga+In in order to keep the thickness of the deposited CIGS layer constant.

75. (New) A method for composition control of copper indium gallium diselenide (CIGS) solar cells fabricated by a co-evaporation deposition process in a process chamber comprising evaporation sources with Cu, In, Ga and Se, said method comprising the step of measuring the individual amounts of elements in the deposited layer, the method comprising providing sets of evaporation sources in rows over the width of a substrate, measuring the individual amounts of elements in the deposited layer in each row, and controlling the evaporant fluxes in the respective rows in order to provide a CIGS film of uniform composition of elements.

76. (New) A method in accordance with claim 75, further comprising measuring the total thickness of the deposited CIGS film at each of the rows and adjusting the flux from at least one of the individual evaporation sources in order to provide a CIGS film of uniform thickness.

77. (New) A method in accordance with claim 75, wherein there are two rows each one comprising a set of evaporation sources, wherein the two rows of evaporation sources are provided at each side of and outside the path along which substrates flow through the deposition chamber.

78. (New) A method in accordance with claim 75, wherein the measurements are taken inside the process chamber.

79. (New) A method in accordance with claim 75, wherein the measurements are taken outside the process chamber.

80. (New) An in-line continuous substrate flow production apparatus for fabrication of copper indium gallium diselenide (CIGS) solar cells comprising a CIGS process chamber in which substrates provided with a molybdenum back contact layer continuously move through a deposition zone (DZ) in the CIGS process chamber, wherein the process chamber comprises a plurality of separated substrate heaters, evaporation sources with Cu, In, Ga and Se, and source heaters, the sets of evaporation sources provided in rows over the width of a substrate, and at least one composition detection device for detecting the respective amounts of deposited elements in the CIGS at each of the rows, and a controller connected to said at least composition detection device and adapted to adjust the evaporant fluxes in the respective rows in response to a detected variation in deposited amount of the corresponding element in order to provide a CIGS layer of uniform composition of elements.

81. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device (20) being adapted to measure the deposited amount of constituents of the deposited CIGS film at each of the rows, and said controller being adapted to adjust the evaporant fluxes in the respective rows in order to provide a CIGS film of uniform thickness.

82. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein there are two rows of vapour sources arranged over the width of the process chamber as seen in the transport direction of the substrates, wherein the two rows of evaporation sources are arranged at each side of and outside the path along which substrates flow through the deposition chamber.

83. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is provided within the process chamber.

84. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is provided outside the process chamber.

85. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein the evaporant vapor sources are arranged at a level below the substrates.

86. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is a device that measures the composition of the CIGS layer directly.

87. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is an X-ray fluorescence device and/or an EDX (energy dispersion X-ray spectroscopy) device adapted to measure the total deposited amounts of each element and thereby also the thickness of the CIGS layer.

88. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein the controller is adapted to receive as input signal a signal representative of the total deposited amounts of each element and in response to said latter signal adjust the fluxes from the evaporant sources in order to provide a uniform thickness of the CIGS film.

89. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at

least one composition detection device is a device that measures the composition of the CIGS layer indirectly.

90. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is a resistance measuring device.

91. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein a separate thickness measuring device connected to the controller for measuring the thickness of the deposited CIGS layer is provided, and the controller is adapted to adjust the fluxes from the evaporant sources to in response to a detected thickness variation in order to provide a CIGS layer of uniform thickness.

92. (New) An in-line continuous substrate flow production apparatus in accordance with claim 91, wherein thickness measuring device is a profilometer.

93. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein there are evaporant sources with Cu, Ga and In and the evaporant sources are arranged in the following order as seen in the transport direction of a substrate: Ga, Cu, In.

94. (New) An in-line continuous substrate flow production apparatus in accordance with claim 93, wherein a further evaporation source with Ga arranged downstream the In evaporation source.

95. (New) An in-line continuous substrate flow production apparatus in accordance with claim 80, wherein there are evaporant sources with Cu, Ga and In and the evaporation sources are arranged in the following order as seen in the transport direction of a substrate: In, Cu, Ga.

96. (New) An in-line continuous substrate flow production apparatus in accordance with claim 95, wherein a further evaporation source with In arranged downstream the Ga evaporation source.